AMENDMENTS TO THE CLAIMS:

Please amend claims as follows:

Claims 1-163. (Cancelled).

164. **(Currently amended)** A physically cross-linked **biocompatible** **hydro**gel produced by **[[the]]** **a** method **[[of]]** comprising **the steps of**:

a) dissolving a biocompatible vinyl polymer in a first solvent to form a vinyl polymer solution**, wherein the first solvent has a Flory interaction parameter (chi value) that is not sufficient for gelation**; **and**

b) ~~**introducing**~~ **contacting** the vinyl polymer solution **with** ~~**in a volume of**~~ a second solvent **in a controlled manner** ~~**to cause gelation**~~, **wherein** the second solvent having a higher Flory interaction parameter **(chi value)** ~~**at a process temperature**~~ than the vinyl polymer solution **that is sufficient for gelation in order** to form a biocompatible **physically** cross-linked **hydro**gel **without chemical cross-linkers, irradiation or thermal cycling**, and wherein the cross-linked **hydro**gel is suitable for *in vivo* use.

165. **(Currently amended)** The physically cross-linked **biocompatible** **hydro**gel of claim 164, wherein the vinyl polymer is polyvinyl alcohol having a molecular weight of about 50 kg/mol to about 300 kg/mol.

166. **(Currently amended)** The physically cross-linked **biocompatible** **hydro**gel of claim 164, wherein the vinyl polymer solution is an aqueous solution of about 10 weight percent to about 30 weight percent polyvinyl alcohol based on the weight of the solution.

167. **(Currently amended)** The physically cross-linked **biocompatible** **hydro**gel of claim 164, wherein the vinyl polymer solution is introduced in an aqueous solution of sodium chloride from about 1.5 molar to about 6.0 molar.

168. **(Currently amended)** The physically cross-linked **biocompatible hydro**gel of claim 164, wherein the vinyl polymer solution is introduced in an aqueous solution of sodium chloride from about 1.5 molar to about 3.0 molar.

169. **(Currently amended)** The physically cross-linked **biocompatible hydro**gel of claim 164, wherein the vinyl polymer solution is introduced in an aqueous solution of sodium chloride from about 1.75 molar to about 6.0 molar.

170. **(Currently amended)** The physically cross-linked **biocompatible hydro**gel of claim 164, further comprising hyaluronic acid.

171. **(Currently amended)** The physically cross-linked **biocompatible hydro**gel of claim 164, further comprising polyacrylic acid.

172. **(Currently amended)** A physically cross-linked **biocompatible** hydrogel substantially free of chemical crosslinkers**, wherein the cross-linked biocompatible hydrogel is formed without chemical cross-linkers, irradiation or thermal cycling**.

173. **(Currently amended)** A physically cross-linked **biocompatible** hydrogel comprising at least about 10 weight percent polyvinyl alcohol solution gelled by immersion in about 2 to about 3 molar sodium chloride, wherein the hydrogel is about 14 percent to about 21 percent physically crosslinked**, and wherein the cross-linked biocompatible hydrogel is formed without chemical cross-linkers, irradiation or thermal cycling**.

174. **(Currently amended)** The physically cross-linked **biocompatible** hydrogel of claim 172, wherein the **hydro**gel comprises about 12 to about 29 percent polyvinyl alcohol.

175. **(Currently amended)** The ~~**method of**~~ **physically cross-linked biocompatible hydrogel of** claim 173, wherein the vinyl polymer solution contains one or more non-gelling components.

176. **(Currently amended)** The physically cross-linked **biocompatible** hydrogel of claim 172 further comprising hyaluronic acid.

177. **(Currently amended)** The physically cross-linked **biocompatible** hydrogel of claim 172 further comprising polyacrylic acid.

178. **(Currently amended)** An article of manufacture comprising a **biocompatible cross-linked** vinyl polymer **hydro**gel having at least one gradient of mechanical properties**, wherein the cross-linked biocompatible hydrogel is formed without chemical cross-linkers, irradiation or thermal cycling**.

179. **(Currently amended)** A one-piece prosthetic intervertebral disk comprising a **biocompatible cross-linked** polyvinyl polymer hydrogel**, wherein the cross-linked biocompatible hydrogel is formed without chemical cross-linkers, irradiation or thermal cycling, and** ~~**wherein the distribution of mechanical properties of**~~ the one-piece prosthetic intervertebral disk **has a** ~~**approximates the**~~ spatial distribution of the mechanical properties **that approximates a** ~~**of the**~~ combination of **[[the]]** nucleus pulposis and **[[the]]** annulus fibrosis of **[[the]] a** natural intervertebral disk.

180. **(Currently amended)** The physically crosslinked **biocompatible hydro**gel of claim 164 further comprising a therapeutic agent.

181. **(Currently amended)** A prosthetic intervertebral disk comprising a biocompatible **physically cross-linked** vinyl polymer hydrogel having a desired physical property, wherein the biocompatible **physically cross-linked** vinyl polymer hydrogel is formed by a method comprising the steps of:

a) providing a vinyl polymer solution ~~**comprising a vinyl polymer**~~ dissolved in a first solvent**, wherein the first solvent has a Flory interaction parameter (chi value) that is not sufficient for gelation**;

b) mixing the vinyl polymer solution with a gellant, wherein the resulting mixture has a higher Flory interaction parameter **(chi value)** than the vinyl polymer solution **that**

is sufficient for gelation, thereby[[;]] inducing gelation of the mixture of **the** vinyl polymer solution and **the** gellant; **and**

c) controlling the gelation rate to form a viscoelastic solution, wherein workability is maintained for a predetermined period, thereby making a biocompatible **physically cross-linked** vinyl polymer hydrogel having the desired physical property**, wherein the cross-linked hydrogel is formed without chemical cross-linkers, irradiation or thermal cycling,[[;]]** and wherein the biocompatible **physically cr oss-linked** vinyl polymer hydrogel is suitable for *in vivo* use.

182. **(Currently amended)** A prosthetic intervertebral disk comprising a biocompatible **physically cross-linked** vinyl polymer hydrogel having a desired physical property, wherein the biocompatible **physically cross-linked** vinyl polymer hydrogel is formed by a method comprising the steps of:

a) dissolving a vinyl polymer in a first solvent to form a vinyl polymer solution**, wherein the first solvent has a Flory interaction parameter (chi value) that is not sufficient for gelation**; and

b) introducing the vinyl polymer solution in a volume of a second solvent to cause gelation, the second solvent having a higher Flory interaction parameter **(chi value) ~~at a process temperature then~~ than** the vinyl polymer solution **that is sufficient for gelation in order** to form a biocompatible **physically cross -linked hydro**gel **without chemical cross-linkers, irradiation or thermal cycling; and~~, wherein the~~**

c) controlling the physical property of the **cross-linked hydro**gel **~~is controlled~~** by controlling the rate of the introduction of the vinyl polymer solution to the second solvent, and wherein the biocompatible **physically cross-linked hydro**gel is suitable for *in vivo* use.